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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/665,447

09/22/2003

Tsuyoshi Kaneko

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10/19/2005

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EXAMINER

NGUYEN, PHILLIP

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/665,447	KANEKO, TSUYOSHI	
	<b>Examiner</b>	<b>Art Unit</b>	
	Phillip Nguyen	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 18-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 14-17 is/are rejected.
- 7) ☒ Claim(s) 12 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9/22/03, 2/10/04, 4/28/05, 5/23/05</u>                                    | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites “a reflectivity adjustment layer” which is not clear how the layer adjusts the reflectivity. It is not clear if the layer is fixedly formed on the emitting surface of the laser or it can be adjusted after being formed.

Claims 1-2 and 4-5 recite “if” which fails to further limit the invention because “if not” the limitation is not considered. It is suggested to use the term --wherein-- instead of “if”.

Claim 14 recites “a current aperture” which is also denoted in the specification and drawings as reference number 105. With the structure of layer 105, Examiner strongly believes that the layer should be called “current blocking layer”, definitely NOT “current aperture”. An opening inside of the current blocking layer 105 is actually “a current aperture” where current is flown through.

Claim 3 recites “the reflectivity adjustment layer” which is lack of antecedence basis.

Claim 13 recites “the first layer” which is lack of antecedence basis.

Claim 15 recites “at least one part of the resonator including a column-like portion” which is not clear how “a column-like portion” is defined.

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Since claims 6-13, and 16-17 depend on claims 1 and 3, they become indefinite as well.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8, 10-11, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson et al. (WO 02/45217).

With respect to claims 1-2 and 4-6, Johnson discloses in Fig. 1 a surface emitting semiconductor laser including a resonator formed on a substrate 102 and emitting a laser beam toward a direction vertical to the substrate from an emitting surface formed on an upper surface of the resonator, the resonator including a first mirror 106 formed above the substrate; an active layer 108; and a second mirror 110 located oppositely to the first mirror and sandwiching the active layer therebetween; a reflectivity adjustment layer 132 that is formed on the emitting surface; the second mirror including a layer of which an optical thickness is  $m_1 \lambda / 2$  ( $m_1$ , a natural number), “if” a wavelength of the laser beam is  $\lambda$ ; and an optical thickness of the reflectivity adjustment layer being  $(2m_2-1) \lambda / 4$  ( $m_2$ , a natural number) (page 15, lines 1-12). Johnson also teaches the reflectivity of the laser beam in a first region 132 being greater than in a second region 130.

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With respect to claim 3, Johnson discloses in Fig. 1 a VCSEL including a resonator (defined by mirror 106 and layer 112) formed on a substrate 102 and emitting a laser beam toward a direction vertical to the substrate from an emitting surface formed on an upper surface of the resonator, comprising a first electrode 122 and second electrode 104 that inject electric current into the resonator, at least a part of the first electrode being formed on the upper surface of the resonator; and an aperture 124 that is formed on the upper surface of the resonator, the emitting surface being formed within the aperture and “the” reflectivity adjustment layer 130/132 being formed on the emitting surface.

With respect to claim 7, it is inherent that the layer 132 being transparent to the beam in order for the laser to emit light beam.

With respect to claim 8, Johnson discloses a side view of the laser; it should be inherent that the laser is round and all of the layers are formed as circle, including the layer 132 as well.

With respect to claim 10, Fig. 1 shows the layer 132 being arranged coaxially with the center axis of the emitting surface.

With respect to claim 15, Johnson discloses at least one part (any part) of the resonator being column-like portion.

3. Claims 1 and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by in view of Scott ('834).

With respect to claim 1, Scott discloses in Fig. 1 a surface emitting semiconductor laser including a resonator formed on a substrate 12 and emitting a laser beam toward a direction vertical to the substrate from an emitting surface formed on an upper surface of the resonator, the resonator including a first mirror 14 formed above the substrate; an active layer 16; and a second

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mirror 18 and 100 located oppositely to the first mirror and sandwiching the active layer therebetween; a reflectivity adjustment layer 10 that is formed on the emitting surface; the second mirror including a layer of which an optical thickness is  $m_1 \lambda / 2$  ( $m_1$ , a natural number), "if" a wavelength of the laser beam is  $\lambda$ ; and an optical thickness of the reflectivity adjustment layer being  $(2m_2-1) \lambda / 4$  ( $m_2$ , a natural number) (see Fig. 8).

With respect to claims 16 and 17, Scott discloses a VCSEL device as claimed in Fig. 1 used in a laser module including a waveguide and a light transmission device comprising said light module in Fig. 10.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (WO 02/45217) in view of Sun ('682). Johnson discloses the claimed invention except for the diameter of the reflectivity adjustment layer being equal or less than  $6 \mu\text{m}$ . Sun discloses the claimed invention in Fig. 1 with first 104 and second mirror 114, and an active layer 112 in between, an a reflectivity adjustment layer 134 with a diameter of  $5 \mu\text{m}$  (col. 3, lines 6-9) except for the optical thicknesses of the second mirror and said adjustment layer. For the advantageous

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benefit of the laser device, it would have been obvious to the one having ordinary skill in the art at the time the invention was made to provide a diameter less than 6  $\mu\text{m}$  as taught by Sun because it is well known in the art to use such a diameter for reflectivity adjustment layer.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (WO 02/45217) in view of Kondo ('157). Johnson discloses the claimed invention except for the reflectivity adjustment layer being composed of at least one resin hardened by heat and a resin hardened by an ultraviolet ray. Kondo discloses a VCSEL and at least one resin hardened by heat and a resin hardened by an ultraviolet ray (col. 7, lines 50-55). For the improvement of the laser, it would have been obvious to the one having ordinary skill in the art at the time the invention was made to provide a resin as taught by Kondo to make the reflectivity adjustment layer.

***Allowable Subject Matter***

6. Claims 12-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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***Communication Information***

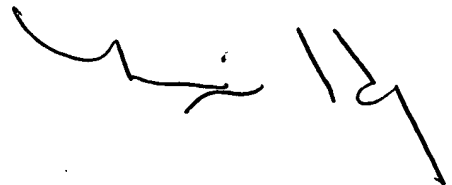
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip Nguyen whose telephone number is 571-272-1947. The examiner can normally be reached on 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MINSUN HARVEY, can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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MINSUN HARVEY  
PRIMARY EXAMINER